

الهيئة العامة للطيران المدني
GENERAL CIVIL AVIATION AUTHORITY



Air Accident Investigation Sector

Incident

- Investigation Summary Report -

AAIS Case N° AIFN/0001/2015

Ground Equipment Collision with Aircraft

Operator:	flydubai
Make and Model:	Boeing 737-800
Nationality and Registration:	The United Arab Emirates, A6-FDC
Place of Occurrence:	Dubai International Airport
State of Occurrence:	The United Arab Emirates
Date of Occurrence:	15 February 2015



Investigation Objective

Since at the time of the occurrence, neither the crew nor passengers had yet boarded the Aircraft, the occurrence was not classified under *Annex 13 to the Convention on International Civil Aviation*, but the Investigation was performed by the Air Accident Investigation Sector (AAIS) pursuant to the UAE *Federal Act No. 20 of 1991*, promulgating the *Civil Aviation Law, Chapter VII- Aircraft Accidents, Article 48*. It is in compliance with the *Civil Aviation Regulations (CARs), Part VI Chapter 3*, in conformity with *Annex 13*, and in adherence to the *Air Accidents and Incidents Investigation Manual*.

The sole objective of this Investigation is to prevent aircraft accidents and incidents. It is not a function of the AAIS to apportion blame or determine liability.

This Summary Report is made public at:

<http://www.gcaa.gov.ae/en/epublication/pages/investigationReport.aspx>

Investigation Process

The occurrence involved a Boeing 737-800 passenger Aircraft, registration A6-FDC, and was notified to the AAIS Duty Investigator (DI) by phone call to the Hotline Number (+971 50 641 4667).

After the Initial/On-Site Investigation phase, the occurrence was classified as an 'Incident'.

The scope of this Investigation is limited to the events leading up to the occurrence; no in-depth analysis of non-contributing factors was undertaken.

Notes:

1. Whenever the following words are mentioned in this Report with first Capital letter, they shall mean the following:
 - (Aircraft)- the Aircraft involved in this Incident
 - (Investigation)- the investigation into the circumstances of this Incident
 - (Incident)- this Incident referred to on the title page of this Report
 - (Report)- this Incident Summary Report

- (dnata)- the ground service provider at Dubai International Airport and part of the Emirates Group.
 - (flydubai)- the Operator of the Aircraft.
2. Unless otherwise mentioned, all times in the Report are local time (UTC was local time – (minus) 4h).
 3. Photos and figures used in this Report are taken from different sources and are adjusted from the original for the sole purpose to improve the clarity of the Report. Modifications to images used in this Report are limited to cropping, magnification, file compression, or enhancement of colour, brightness, contrast, or addition of text boxes, arrows or lines.
 4. This Summary Report is structured using the relevant headings as depicted in *Annex 13* Final Report format.
 5. Airport Operator is an aerodrome certificate holder that operates under *CAR part IX*.
 6. Ground Handling Agents are all service providers that produce service to the aircraft or its operations.



Factual Information

History of the Incident

On 15 February 2015, flydubai Boeing 737-800 Aircraft, registration A6-FDC, was parked on Stand Q-05 of Dubai International Airport (OMDB), and was scheduled to operate flight number FZ4359 to Bagram (OAIX), at 0528 local time (LT).

After the usual morning briefing, the handling agent (dnata) supervisor handed the tasks schedule to the senior ground operator. The schedule included the names of the operators with their nominated tasks. The dnata senior ground operator supervised three operators during the shift, and two of the operators were nominated to operate two Mobile Conveyer Belts (MCBs) to load the Aircraft.

At approximately 0515 LT, the senior ground operator dropped off the two nominated MCB operators at the parking bays where the two MCBs were located. After performing the required equipment checks using the *MCB Operating Instruction*, each of the operators drove his assigned MCB to stand Q-05 where the Aircraft was parked.

The MCBs were to be docked with the Aircraft at the forward and aft cargo doors. One of the operators had planned to position his MCB to the aft cargo door, but while driving towards the door, and at about five meters from the right engine cowling, the operator noticed that his colleague had already positioned the other MCB at the same door.

The operator realised that he now had to drive the MCB towards the vacant forward cargo door. The operator stopped the MCB and removed his feet from the MCB brake pedal in order to turn left towards the forward cargo door. Suddenly, the MCB moved forward towards the Aircraft and collided with the right engine causing damage to the engine shroud, acoustic panel, and inlet cowl (figures 1 and 2).

There were no injuries to persons as a result of the collision.

Damage to Aircraft

- The engine shroud sustained damage at the 6 o'clock position.
- Acoustic panel tear at the 8 o'clock position.
- One deep long scratch on the right engine inlet cowl at the 8 o'clock position (figure 2).



Figure 1. The MCB in contact with the engine. The MCB was parallel to the Aircraft



Figure 2. Final position of MCB inside engine inlet damage

Personnel Information

The MCB Operator

The MCB operator joined dnata in 2008. The operator possessed a general driving license rated as 'light vehicle driver' in 2005. Since joining dnata, the operator received training as a 'tractor operator' and 'pick-up driver'. After training, the operator worked as a 'tractor operator' until 2010.

Thereafter, the operator was promoted to 'airside operator grade 3' as per the dnata employment scale levels. He then received training on passenger steps, hi-loader, transporter of cargo loading-unloading, and MCB operations.

Meteorological Information

The weather report between 0500 and 0600 LT showed wind speed of about 5 knots, from



varying directions between 150° to 170°, CAVOK¹, and QNH 1011 mbar.

The Incident occurred during twilight and the weather was not a factor in this Incident.

Organizational and Management Information

flydubai

flydubai holds an Air Operator Certificate (AOC) issued by the UAE General Civil Aviation Authority to operate aircraft type B737.

flydubai submitted its *Ground Handling Manual* to dnata as instruction for ground handling including a full schedule of detailed ground handling procedures (*GHM, REV. 51 May 2015, section 6*).

dnata

dnata provides ground handling services including supply of and maintenance of ground support equipment, and the technical handling of third party airlines. At the time of the Incident, dnata was contracted to flydubai for ramp services.

dnata Airside Procedures

The procedures on the day of the Incident did not contain provisions for allocating tasks to operators of the same type of equipment who were servicing the same aircraft. The procedures did not allow for the provision of instructions to advise each of the MCB operators as to which cargo compartment his conveyer belt should be positioned.

dnata Airside operator's rostering

At the time of the Incident, the duty roster covered eight hour days for six consecutive days in different shifts (two mornings, two afternoons and two nights), followed by two days off. The working hours for each shift were as follows:

(All timings are local time)

- Morning shift started at 0600, and ended at 1400.

- Afternoon shift started at 1400, and ended at 2200; and
- Night shift started at 2200, and ended at 0600 on the next morning.

The starting and ending time of the duty roster had been changed from 1 February 2015 to:

- Morning shift started at 0800, and ended at 1600;
- Afternoon shift started at 1600, and ended at 2400; and
- Night shift started at 2400, and ended at 0800 on the next morning.

The MCB operator was scheduled to work the night shift. He reported for duty at 2400 LT. The Incident occurred at 0630 LT in the last quarter of the duty period.

Dubai International Airport

Dubai International Airport is certified under the UAE *CAR Part IX- Aerodromes*, and Dubai Airports is the recognised airport operator

The Airport is equipped with three terminals, and the Incident Aircraft was parked at Terminal 1. The stand numbers were marked on the tarmac in bold letters and were equipped with lights. The lights were lit at the time of the Incident.

Additional Information

The operations and handling services are referenced in the *Service Level Agreement (SLA)* between the air operator and the ground handling agent. The airport had no direct contribution in such agreements.

The policy and procedures of the turnaround services are usually established by the air operator in its *Ground Operation Manual*. Ground handling agents have their own operations standard set forth in the International Air Transport Association (IATA) *Ground Operations Manual (IGOM)*².

Ground handling agents which satisfy International Air Transport Association requirements are qualified for the IATA Safety

¹ CAVOK: Ceiling and Visibility OK

² The IGOM is a definitive source for the latest industry-approved standards harmonizing ground handling processes and procedures for frontline personnel.



Audit of Ground Operations (ISAGO)³ certificate, which is an essential requirement for entering into service level agreements with air operators.

Dubai Airports operates a Safety Management System (SMS) that includes inspection and audit programs of the ground handling agents. According to the program, the Operations Duty Manager (ODMA) is assigned to carry out at least four turnaround inspections daily which is also documented in the *Aerodrome Manual*. In addition, Dubai Airports conduct annual audits of the ground handling agents. The inspections and audits are carried out according to checklists contained in the *Aerodrome Manual*. The audit findings are summarized by the Dubai Airports SMS team and discussed on a monthly basis. In addition, accidents or incidents involving ground handling agents are discussed by the SMS team and decisions made regarding required actions.

There is no regulatory reference that empowers the Airport to carry out oversight functions on airport stakeholders, and there are no specific *Conditions of Use*⁴ applicable to all stakeholders, similar to the one used as a term of reference between Dubai Airports and air operators.

At the time of the Incident, the SMS⁵ used by dnata was that of the Emirates Group. Although dnata has a *Hazard Identification, Risk Assessment and Determining Controls (HIRADC)* procedure, which has been in place since 6 February 2015, and has been reviewed by Dubai Airports during previous SMS audits; the *HIRADC* register was not shared with Dubai Airports. However, dnata is in the process of improving the procedure to work more collaboratively with Dubai Airports on risk assessments, particularly where hazards are facility related.

Appendix 20 of *CAR Part IX- Acceptable Means of Compliance and Guidance Material on Aerodrome Management – Safety Programmes*,

requires aerodrome operators to establish a 'maneuvering area/apron safety committee(s)' with members representing different organizations, including ground handling agents. Among other tasks, the committee is assigned to:

- evaluate operational safety issues;
- receive reports and statistical information on accidents and incidents, and propose solutions; and
- advice on Movement Area/apron safety issues."

³ ISAGO program is an internationally recognized and accepted system for assessing the operational management and control systems of an organization that provides ground handling services for airlines (the "Provider"). ISAGO is based on industry-proven quality audit principles and structured to ensure a standardized audit with consistent results

⁴ *Conditions of Use* is a document that contains terms of reference that govern the relationship between airport and aircraft operators. In addition to the commercial aspects

that form its majority, the condition of use contains Terms of Reference related to ramp operations

⁵ Emirates Group SMS has been developed to communicate the approach to Safety Management throughout the Group. The manual details the policies, procedures and requirements that are implemented to meet the regulatory requirements of *CAR Part X* and other applicable *CARs*



Analysis

Positioning of Equipment

There are two locations in the Aircraft for loading/unloading: the forward and the aft cargo doors. The lack of a policy to assign each MCB to a specific door led to ambiguity for the ground handling supervisor when assigning two airside operators for simultaneous MCB operations on the same aircraft.

The Incident MCB operator brought the MCB from the parking bay E-43 to parking bay Q-05 where the Aircraft was parked. The MCB operator decided to drive the MCB to the aft cargo door. When he was moving towards the aft cargo door, he saw that the other MCB had already been positioned at that door. Accordingly, the MCB operator realized that he must drive the MCB towards the vacant forward right cargo door.

The Investigation was unable to determine the reason for the collision between the MCB and the engine. Two likely scenarios were considered; the MCB driver was distracted and his attention was diverted from the task at hand resulting in a loss of situational awareness or, instead of depressing the brake pedal he mistakenly depressed the accelerator pedal causing the MCB to impact the engine (figure 1).

dnata did not have explicit procedure for assigning specific positions and routes for simultaneous similar tasks operated by different operators. Therefore, the decision of where to allocate the equipment was left to the equipment operator.

Leaving decisions in normal operations for field staff makes the operation vulnerable to sudden changes that may interrupt the human interaction with the environment and machine. Distraction, time pressure, tiredness will add more to the likelihood of reacting inappropriately to the sudden change.

If communications among operators in a work place is insufficient, the information will not be updated and communicated on due time between the involved operators, accordingly it is likely that at some stages, similar tasks made by different people will cross each other's at some point causing incidents.

The perception of the MCB operator to distance, heading, and speed, was most likely downgraded by distraction caused by unforeseen change and time pressure. The MCB operator

distraction could not be prevented because there was no predefined policy of assigning tasks.

Safety Management System

The change of the rostering time was made by the dnata Resource Planning Department without involvement of dnata Safety Department.

The effect of duty time changes on the circadian rhythm of the operators and the likelihood involvement in fatigue, could not be determined by the Investigation. But the Investigation believes that the lack of risk assessment of such change would keep latent hazards in place.

It was not determined whether the changes to the roster had led to unexpected fatigue, resulting in the occurrence of the Incident. Changing the roster without carrying out a risk assessment deprived dnata of valuable safety information. dnata HIRADC procedure did not require risk assessment on the impact of the roster change.

At the time of the Incident, dnata was operating under the remit of the Emirates Group SMS.

The links between dnata and Dubai Airports' SMS were:

- Accident and incident reporting
- ASAG/ Key stakeholder meeting
- Accident investigations
- Joint safety campaigns
- Joint HAZOPs

UAE Civil Aviation Requirements

The current *Civil Aviation Regulations* state that the aerodrome manual is a contract, and the airport should utilize it in order to enforce the highest levels of safety.

The airport can assume the management of the integrated SMS of safety. This function is supported by the fact that the airport is certificated by a comprehensive regulatory system promulgated by the GCAA which is the official regulatory body of the UAE.

The direct relationship between the airport and the GCAA gives the opportunity to the airport to be in direct touch with systematic safety and quality functions and then to play an official role in the



implementation of the SMS among all operators. Figure 3 illustrates a proposed SMS structure for the airport and the other operators.

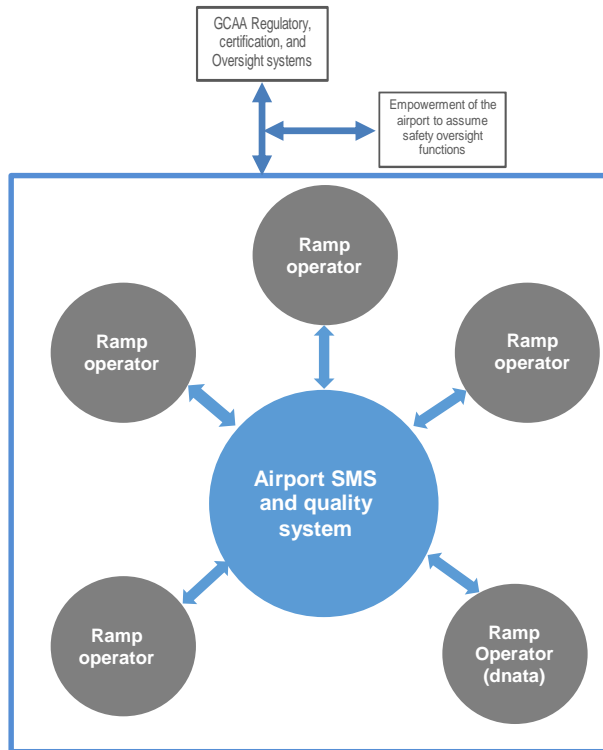


Figure 3. Network of SMS among airport and other operators

Conclusions

Findings

- The Aircraft was certificated, equipped and maintained in accordance with the existing requirements of the *Civil Aviation Regulations* of the United Arab Emirates.
- The Aircraft was airworthy when it was prepared for the flight before the Incident.
- The MCB operator was licensed, trained and qualified for his responsibilities.
- dnata *Ground Handling Manual* did not contain an explicit procedure for exact equipment positioning whenever there was more than one similar piece of equipment being operated at the same aircraft. The parking positions were left to the individual ground operators' choice.
- dnata operated under the remit of the Emirates Group SMS.
- Risk Assessment was not performed for the airside operators' rostered duty time change.

Causes

The Air Accident Investigation Sector determines that the probable causes of the Incident were:

- Either the MCB driver was distracted or his attention was diverted from the task at hand when he noticed the other MCB docked at the aft cargo door which caused him to lose focus and concentration or, instead of depressing the brake pedal he mistakenly depressed the accelerator pedal causing the MCB to unexpectedly move forward and impact the engine.
- There was no specific procedure in place to precisely task each of the ground operators to position the equipment at a specific aircraft cargo door. The decision as to where to position the equipment was left to the discretion of the individual operators. The plan of the MCB operator, to position the MCB at the aft cargo door was not possible when he realized that the other MCB operator had already positioned his MCB at that location.
- The Risk Management System of the handling agent did not detect the possibility of uncoordinated task performance in the positioning of equipment to the aircraft.

Safety Recommendations

Safety Actions Taken

The following response was submitted by dnata before the issuance this Summary Report:

“dnata has carried out a risk assessment of activities and equipment operating within the ERA and implemented the following control measures:

- Marshalling for all equipment positioning to an aircraft
- Marshalling training of all staff working within the Equipment Restraint Area (ERA)
- Revised work instruction showing correct approach of MCB or any GSE at the forward and aft hold of an aircraft.”

The dnata action is acceptable to the AAIS.



Summary Report Safety Recommendations

The Air Accident Investigation Sector recommends that:

dnata

It is recommended that dnata in conjunction with Dubai Airports:

SR41/2016

Carry out a Risk Assessment Study for any change of procedure, equipment, or work roster that may affect the performance of airside operators.

Dubai Airports

It is recommended that Dubai Airports:

SR42/2016

Establish procedure to enhance oversight of ground handling agents to ensure that the handling agents have well-established safety and quality management systems.

The General Civil Aviation Authority (GCAA) of the United Arab Emirates

It is recommended that the GCAA:

SR43/2016

Promulgate requirements for the integration of Safety Management Systems operated by the various operators and service providers at the airport with the structure of the airport Safety Management System that is officially recognized by *CAR Part IX- Aerodromes*, and *CAR Part X- Safety Management System*.

SR44/2016

Promulgate requirements that empower airport operators to assume safety and quality oversight of airside operators and service providers.

**This Report is issued by:
Air Accident Investigation Sector
General Civil Aviation Authority
The United Arab Emirates**

Fax: +971 2 4491 270
Email: aai@gcaa.gov.ae
Website www.gcaa.gov.ae